**Sustainable catalysts for DRM reaction based on leachate solutions of spent autocatalysts**

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1% Pt-based catalysts have been fabricated by impregnation of both commercial and synthesized cerium oxide powders with platinum precursors from a leachate solution obtained from hydrometallurgical processing of spent diesel oxidation catalysts. For comparison, a synthetic leachate solution containing only commercial Pt has been used. Catalysts were characterized by several techniques to evaluate their physicochemical characteristics. Dry reforming of methane (DRM) and Reverse Water gas Shift (RWGS) tests were carried out in a fixed-bed reactor. DRM results showed for the catalysts prepared from the leachate solution a high conversion of $CH_4$ and $CO_2$, reaching values respectively of ~94 and ~96% and a $H_2$/CO ratio up to 0.9 at 850°C in case of catalysts purified from NaCl residues. The amount of impurities (other than NaCl) contained in the leachate solution and their effect on the catalysts' behaviour towards DRM reaction have been investigated respectively by ICP-OES analysis and by comparing the performances of catalysts prepared from synthetic and real leachate solutions. Best catalysts were also tested towards the RWGS reaction, reaching $CO_2$ conversion values of 60-70% with nearly 100% selectivity to CO. Time on Stream experiments of DRM and RWGS revealed a quite good stability of catalysts, which suggests a negligible amount of carbon deposition on the catalyst's surface, in accordance with results from Raman analysis.